

Date: Fri, 26 Nov 93 04:30:38 PST  
From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>  
Errors-To: Ham-Space-Errors@UCSD.Edu  
Reply-To: Ham-Space@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Space Digest V93 #91  
To: Ham-Space

Ham-Space Digest                      Fri, 26 Nov 93                      Volume 93 : Issue    91

Today's Topics:

ANS-324 BULLETINS  
ORBS\$323.2L.AMSAT  
ORBS\$323.MICRO.AMSAT  
ORBS\$323.MISC.AMSAT  
ORBS\$323.OSCAR.AMSAT  
ORBS\$323.WEATH.AMSAT

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>  
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

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Date: Sun, 21 Nov 1993 17:44:12 MST  
From: nntp.ucsb.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!  
nntp.cs.ubc.ca!alberta!ugc!nebulus!ve6mgs!usenet@network.ucsd.edu  
Subject: ANS-324 BULLETINS  
To: ham-space@ucsd.edu

SB SAT @ AMSAT    \$ANS-324.01  
MORE DOVE TELEMETRY FORMATS

HR AMSAT NEWS SERVICE BULLETIN 324.01 FROM AMSAT HQ  
SILVER SPRING, MD NOVEMBER 20, 1993  
TO ALL RADIO AMATEURS BT  
BID: \$ANS-324.01

NK6K Explains More Of DOVE's Telemetry Format

The LSTAT line is sent by the loader portion of PHT (the loader/command/

telemetry task). Its purpose is to show the state of the software loader process so that if something goes wrong during upload, the DOVE ground command stations can tell what needs to be done to continue the process.

The LSTAT line comes in two types, as shown below.

I P:0xhhhh o:n l:nnnn f:nnnn, d:n st:n\

A: 0xhhhh, P:0xhhhh, o:n l:nnnn f:nnnn, d:n st:n

I - means there is no software load in progress (inactive)

A: - means a software load is in progress (active). hhhh is the segment address of the program being loaded.

P: - the segment of the running program (PHT). The initial load of PHT is always at 0x3000. Any other address here means PHT has been reloaded.

o: - The number of times the HDLC output queue was full when PHT tried to send a frame. This is left over from debugging the only major bug found in the I/O drivers since launch. A bug occasionally caused a 65,535 byte frame to be sent, filling the output queue for nine minutes. This should always be zero.

l: - The largest free memory block, in decimal paragraphs. To find the the number of free bytes in the largest block, multiply this number by 16. This number shows the largest program that can be loaded at that time.

f: - The total amount of free memory, in decimal paragraphs.

d: - The digipeat flag, 1 is digipeat on, 0 is digipeat off. (Will always be off for DOVE)

st:- The task number of the last task loaded.

[The AMSAT News Service (ANS) would like to thank Harold Price (NK6K) for this bulletin item.]

/EX

SB SAT @ AMSAT \$ANS-324.02

AMSAT OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 324.02 FROM AMSAT HQ

SILVER SPRING, MD NOVEMBER 20, 1993

TO ALL RADIO AMATEURS BT

BID: \$ANS-324.02

## Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date	UTC	Mode	Phs	NCS	Alt NCS
28-Nov-93	0230	B	39	WJ9F	VE2LVC
12-Dec-93	0435	B	180	W90DI	WB6LLO
3-Jan-94	0200	B	160	WA5ZIB	N7NQM

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. In the unlikely event that either the Net Control Station (NCS) or the alternate NCS do not call on frequency, any participant is invited to act as the NCS.

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## Slow Scan Television on AO-13

SSTV sessions will be held on immediately after the OPS Nets a downlink on a Mode-B downlink frequency 145.960 MHz.

/EX

SB SAT @ AMSAT \$ANS-324.03  
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 324.03 FROM AMSAT HQ  
SILVER SPRING, MD NOVEMBER 20, 1993  
TO ALL RADIO AMATEURS BT  
BID: \$ANS-324.03

Weekly OSCAR Status Reports: 20-NOV-93

## AO-13: Current Transponder Operating Schedule:

L QST \*\*\* AO-13 TRANSPONDER SCHEDULE \*\*\* 1993 Nov 15-Jan 31  
Mode-B : MA 0 to MA 95 ! / Eclipses, max  
Mode-B : MA 95 to MA 180 ! OFF Dec 07 - 24. < duration 136  
Mode-B : MA 180 to MA 218 ! \ minutes.  
Mode-S : MA 218 to MA 220 !<- S beacon only  
Mode-S : MA 220 to MA 230 !<- S transponder; B trsp. is OFF  
Mode-BS : MA 230 to MA 256 ! Blon/Blat 240/-5

Omnis : MA 250 to MA 150 ! Move to attitude 180/0, Jan 31  
A0-13 will experience another partial solar eclipse on 1993 Dec 13 [Mon].  
It sees the Moon eclipse the Sun from 10:09 - 10:59 UTC with a maximum 53% obscuration at 1034 utc. This is Orbit #4211 MA 73-92. The encounter will be "visible" on the telemetry to stations throughout the USA and Japan. Reports would be appreciated. Stations who observed this spectacular eclipse of Nov 13 will know what to look for. Eclipses of sun by earth commence on Dec 07 [Tue] and continue until Dec 24 [Fri]. The eclipses are of course total. The maximum lasts 2 hours and 16 minutes, and is the longest A0-13 has ever experienced. The telemetry during these outages is very interesting, particularly the spacecraft temperatures; some reach -40 C. The Mode-B transponder will be OFF from MA 95 to 180 during this two week period. [G3RUH/DB20S/VK5AGR]

DOVE: TLM has been copied moderately well on 145.825 MHz, with much stronger signal levels on the S-band beacon. Please send any telemetry that you capture to PY2BJO at his INTERNET address of py2bjo@amsat.org. [W7IUV]

A0-16: Operating normally. [WH6I]

U0-22: Operating normally. [WH6I]

L0-19: Operating normally. [WH6I]

K0-23: Up and running. Busy as usual. There are a number of images. [WH6I]

K0-25: File system is up but not open for uploads. It appears that the satellite has taken an EIS image, but it is not available. [WH6I]

I0-26: Up and running with a lot of activity. [WH6I]

F0-20: The F0-20 Mode JA period on the 17-18th of November provided strong downlink and beacon signals but only moderate activity during the passes that were visible. The following is the F0-20 operating schedule:

Analog mode: 24-Nov-93 08:20 -to- 25-Nov-93 8:38 UTC

01-Dec-93 08:43 -to- 07-Dec-93 7:16 UTC

15-Dec-93 07:41 -to- 22-Dec-93 8:05 UTC

Digital mode: otherwise noted above. In December, analog mode and digital mode will be ON alternately for a week, respectively.  
[W7IUV & JJ1WTK]

RS-10: RS-10 has had excellent downlink signals, but only moderate activity during the last week. This bird produces more fun per pass than any other amateur satellite in orbit. [W7IUV]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

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Date: Fri, 19 Nov 1993 06:49:00 MST  
From: nntp.ucsb.edu!library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!  
math.ohio-state.edu!cyber2.cyberstore.ca!nntp.cs.ubc.ca!alberta!ugc!nebulus!  
ve6mgs!usenet@network.ucsd.edu  
Subject: ORBS\$323.2L.AMSAT  
To: ham-space@ucsd.edu

SB KEPS @ AMSAT \$ORBS-323.N  
2Line Orbital Elements 323.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT  
FROM WA5QGD FORT WORTH,TX November 19, 1993  
BID: \$ORBS-323.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:  
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ  
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJKKKKKZ  
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN  
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

A0-10

1 14129U 83058B 93321.57691393 -.00000112 00000-0 10000-3 0 2118  
2 14129 27.1956 355.7539 6019652 131.0023 299.1524 2.05880635 78414  
U0-11

1 14781U 84021B 93320.59791365 .00000224 00000-0 41964-4 0 6126  
2 14781 97.7971 340.1743 0010901 227.3657 132.6634 14.69084435519091  
RS-10/11

1 18129U 87054A 93320.53837545 .00000061 00000-0 60485-4 0 8120  
2 18129 82.9209 126.0240 0010352 256.4589 103.5413 13.72326438320740  
A0-13

1 19216U 88051B 93315.34314830 -.00000053 00000-0 10000-4 0 8137  
2 19216 57.8997 284.7483 7226538 327.9276 3.4613 2.09719999 41435

FO-20

1 20480U 90013C 93310.07362541 -.000000005 00000-0 14874-4 0 6071  
2 20480 99.0217 139.2984 0541030 125.0547 240.2545 12.83221816175512

AO-21

1 21087U 91006A 93320.47796564 .000000084 00000-0 82657-4 0 3683  
2 21087 82.9418 300.1208 0034449 319.1873 40.6687 13.74528168140362

RS-12/13

1 21089U 91007A 93317.61990766 .000000004 00000-0 -23873-5 0 6129  
2 21089 82.9233 171.3110 0029494 351.2997 8.7626 13.74029180139048

ARSENE

1 22654U 93031B 93319.82294071 -.000000052 00000-0 10000-3 0 2099  
2 22654 1.4256 113.1022 2930832 161.7997 211.8626 1.42202608 2728

UO-14

1 20437U 90005B 93320.70053268 .000000071 00000-0 35429-4 0 9128  
2 20437 98.6062 43.2321 0011712 93.9046 266.3482 14.29803677199228

AO-16

1 20439U 90005D 93320.27451247 .000000064 00000-0 32755-4 0 7120  
2 20439 98.6124 43.8287 0012274 95.5349 264.7257 14.29860785199173

DO-17

1 20440U 90005E 93320.66928486 .000000060 00000-0 31121-4 0 7121  
2 20440 98.6144 44.4763 0012250 94.2945 265.9628 14.29997894199240

WO-18

1 20441U 90005F 93320.22118847 .000000057 00000-0 29710-4 0 7134  
2 20441 98.6142 44.0490 0012764 95.8251 264.4402 14.29975696199182

LO-19

1 20442U 90005G 93320.70317511 .000000061 00000-0 31205-4 0 7123  
2 20442 98.6151 44.7345 0013139 93.7468 266.5215 14.30068015199267

UO-22

1 21575U 91050B 93320.68042724 .000000105 00000-0 42463-4 0 4124  
2 21575 98.4578 34.2356 0006986 200.1876 159.9027 14.36865218122562

KO-23

1 22077U 92052B 93320.59051504 .000000000 00000-0 10000-3 0 3091  
2 22077 66.0900 5.1031 0005093 341.0856 18.9960 12.86281800 59446

AO-27

1 22825U 93061C 93320.66241511 .000000070 00000-0 36625-4 0 2111  
2 22825 98.6771 33.3777 0009303 106.2143 254.0076 14.27590086 7363

IO-26

1 22826U 93061D 93320.65872634 .000000073 00000-0 37587-4 0 2129  
2 22826 98.6768 33.3808 0009869 107.8468 252.3794 14.27692506 7367

KO-25

1 22830U 93061H 93319.73628661 .000000064 00000-0 33726-4 0 2121  
2 22830 98.5788 31.9792 0012486 82.0123 278.2466 14.28016160 7236

NOAA-9

1 15427U 84123A 93321.67817478 .000000105 00000-0 66146-4 0 6128  
2 15427 99.0821 4.3682 0015882 95.7490 264.5523 14.13562457460466

NOAA-10

1 16969U 86073A 93315.75032400 .000000081 00000-0 42765-4 0 5091  
2 16969 98.5140 326.3695 0012248 244.0314 115.9574 14.24842726371642

MET-2/17

1	18820U	88005A	93319.86072672	.000000065	00000-0	52347-4	0	2116
2	18820	82.5421	78.2816 0017893	61.8037	298.4910	13.84697554292837		

MET-3/2

1	19336U	88064A	93319.83299665	.000000043	00000-0	10000-3	0	2119
2	19336	82.5384	114.6617 0017926	77.8342	282.4811	13.16962335255171		

NOAA-11

1	19531U	88089A	93315.67695101	.000000165	00000-0	99084-4	0	4090
2	19531	99.1508	294.5292 0012515	27.3413	332.8509	14.12931327264500		

MET-2/18

1	19851U	89018A	93320.51300057	.000000045	00000-0	35160-4	0	2124
2	19851	82.5191	313.4772 0015680	100.7230	259.5690	13.84349177238266		

MET-3/3

1	20305U	89086A	93320.32104910	.000000043	00000-0	10000-3	0	9135
2	20305	82.5525	57.5423 0017403	95.7518	264.5640	13.16021908195110		

MET-2/19

1	20670U	90057A	93320.64092393	.000000015	00000-0	79036-5	0	7128
2	20670	82.5491	17.2997 0016711	28.5586	331.6512	13.84181803171211		

FY-1/2

1	20788U	90081A	93314.27490495	.000000352	00000-0	25587-3	0	8161
2	20788	98.8528	336.2622 0014224	264.8255	95.1288	14.01329924163048		

MET-2/20

1	20826U	90086A	93320.47980517	.000000052	00000-0	42267-4	0	7113
2	20826	82.5249	315.2181 0011921	288.0238	71.9627	13.83563968158341		

MET-3/4

1	21232U	91030A	93320.51833216	.000000043	00000-0	10000-3	0	6155
2	21232	82.5409	319.9466 0013471	2.5209	357.5653	13.16456371123379		

NOAA-12

1	21263U	91032A	93315.68793624	.000000176	00000-0	87457-4	0	8162
2	21263	98.6427	343.0215 0013434	143.1680	217.0407	14.22331177129619		

MET-3/5

1	21655U	91056A	93320.38880675	.000000043	00000-0	10000-3	0	6125
2	21655	82.5551	267.0163 0014334	12.2322	347.9178	13.16825934108458		

MET-2/21

1	22782U	93055A	93320.66678128	.000000033	00000-0	25012-4	0	2111
2	22782	82.5521	14.8526 0023798	100.3379	260.0455	13.82991168 10713		

MIR

1	16609U	86017A	93321.57070583	.000007939	00000-0	10816-3	0	5866
2	16609	51.6139	168.8603 0005214	358.7317	0.6246	15.58545846443041		

HUBBLE

1	20580U	90037B	93320.38852573	.000000748	00000-0	63165-4	0	3620
2	20580	28.4687	163.2233 0004748	200.0009	160.0464	14.92922012194272		

GRO

1	21225U	91027B	93321.24933334	.00018416	00000-0	19624-3	0	2224
2	21225	28.4618	264.6526 0074975	90.1642	270.7885	15.58731637 24209		

UARS

1	21701U	91063B	93315.59270845	-.00001996	00000-0	-16511-3	0	4125
2	21701	56.9842	310.8939 0005642	92.8950	267.4094	14.96195848118366		

POSAT

1 22829U 93 61 G 93289.11726978 .000000072 000000-0 37231-4 0 2042  
2 22829 98.6763 2.0610 0010043 184.4594 175.6498 14.27975951 2862  
/EX

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Date: Fri, 19 Nov 1993 06:40:00 MST  
From: nntp.ucsb.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!  
nntp.cs.ubc.ca!alberta!ugc!nebulus!ve6mgs!usenet@network.ucsd.edu  
Subject: ORBS\$323.MICRO.AMSAT  
To: ham-space@ucsd.edu

SB KEPS @ AMSAT \$ORBS-323.D  
Orbital Elements 323.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS  
FROM WA5QGD FORT WORTH,TX November 19, 1993  
BID: \$ORBS-323.D  
TO ALL RADIO AMATEURS BT

Satellite: UO-14  
Catalog number: 20437  
Epoch time: 93320.70053268  
Element set: 912  
Inclination: 98.6062 deg  
RA of node: 43.2321 deg  
Eccentricity: 0.0011712  
Arg of perigee: 93.9046 deg  
Mean anomaly: 266.3482 deg  
Mean motion: 14.29803677 rev/day  
Decay rate: 7.1e-07 rev/day^2  
Epoch rev: 19922  
Checksum: 290

Satellite: AO-16  
Catalog number: 20439  
Epoch time: 93320.27451247  
Element set: 712  
Inclination: 98.6124 deg  
RA of node: 43.8287 deg  
Eccentricity: 0.0012274  
Arg of perigee: 95.5349 deg  
Mean anomaly: 264.7257 deg  
Mean motion: 14.29860785 rev/day  
Decay rate: 6.4e-07 rev/day^2  
Epoch rev: 19917  
Checksum: 328



Satellite: D0-17  
Catalog number: 20440  
Epoch time: 93320.66928486  
Element set: 712  
Inclination: 98.6144 deg  
RA of node: 44.4763 deg  
Eccentricity: 0.0012250  
Arg of perigee: 94.2945 deg  
Mean anomaly: 265.9628 deg  
Mean motion: 14.29997894 rev/day  
Decay rate: 6.0e-07 rev/day<sup>2</sup>  
Epoch rev: 19924  
Checksum: 339

Satellite: W0-18  
Catalog number: 20441  
Epoch time: 93320.22118847  
Element set: 713  
Inclination: 98.6142 deg  
RA of node: 44.0490 deg  
Eccentricity: 0.0012764  
Arg of perigee: 95.8251 deg  
Mean anomaly: 264.4402 deg  
Mean motion: 14.29975696 rev/day  
Decay rate: 5.7e-07 rev/day<sup>2</sup>  
Epoch rev: 19918  
Checksum: 313

Satellite: L0-19  
Catalog number: 20442  
Epoch time: 93320.70317511  
Element set: 712  
Inclination: 98.6151 deg  
RA of node: 44.7345 deg  
Eccentricity: 0.0013139  
Arg of perigee: 93.7468 deg  
Mean anomaly: 266.5215 deg  
Mean motion: 14.30068015 rev/day  
Decay rate: 6.1e-07 rev/day<sup>2</sup>  
Epoch rev: 19926  
Checksum: 285

Satellite: U0-22  
Catalog number: 21575  
Epoch time: 93320.68042724  
Element set: 412  
Inclination: 98.4578 deg

RA of node: 34.2356 deg  
Eccentricity: 0.0006986  
Arg of perigee: 200.1876 deg  
Mean anomaly: 159.9027 deg  
Mean motion: 14.36865218 rev/day  
Decay rate: 1.05e-06 rev/day<sup>2</sup>  
Epoch rev: 12256  
Checksum: 307

Satellite: K0-23  
Catalog number: 22077  
Epoch time: 93320.59051504  
Element set: 309  
Inclination: 66.0900 deg  
RA of node: 5.1031 deg  
Eccentricity: 0.0005093  
Arg of perigee: 341.0856 deg  
Mean anomaly: 18.9960 deg  
Mean motion: 12.86281800 rev/day  
Decay rate: .00000000 rev/day<sup>2</sup>  
Epoch rev: 5944  
Checksum: 250

Satellite: A0-27  
Catalog number: 22825  
Epoch time: 93320.66241511  
Element set: 211  
Inclination: 98.6771 deg  
RA of node: 33.3777 deg  
Eccentricity: 0.0009303  
Arg of perigee: 106.2143 deg  
Mean anomaly: 254.0076 deg  
Mean motion: 14.27590086 rev/day  
Decay rate: 7.0e-07 rev/day<sup>2</sup>  
Epoch rev: 736  
Checksum: 275

Satellite: I0-26  
Catalog number: 22826  
Epoch time: 93320.65872634  
Element set: 212  
Inclination: 98.6768 deg  
RA of node: 33.3808 deg  
Eccentricity: 0.0009869  
Arg of perigee: 107.8468 deg  
Mean anomaly: 252.3794 deg  
Mean motion: 14.27692506 rev/day  
Decay rate: 7.3e-07 rev/day<sup>2</sup>

Epoch rev: 736  
Checksum: 337

Satellite: K0-25  
Catalog number: 22830  
Epoch time: 93319.73628661  
Element set: 212  
Inclination: 98.5788 deg  
RA of node: 31.9792 deg  
Eccentricity: 0.0012486  
Arg of perigee: 82.0123 deg  
Mean anomaly: 278.2466 deg  
Mean motion: 14.28016160 rev/day  
Decay rate: 6.4e-07 rev/day^2  
Epoch rev: 723  
Checksum: 301

/EX

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Date: Fri, 19 Nov 1993 06:46:00 MST  
From: nntp.ucsb.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!  
nntp.cs.ubc.ca!alberta!ugc!nebulus!ve6mgs!usenet@network.ucsd.edu  
Subject: ORBS\$323.MISC.AMSAT  
To: ham-space@ucsd.edu

SB KEPS @ AMSAT \$ORBS-323.M  
Orbital Elements 323.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES  
FROM WA5QGD FORT WORTH, TX November 19, 1993  
BID: \$ORBS-323.M  
TO ALL RADIO AMATEURS BT

Satellite: MIR  
Catalog number: 16609  
Epoch time: 93321.57070583  
Element set: 586  
Inclination: 51.6139 deg  
RA of node: 168.8603 deg  
Eccentricity: 0.0005214  
Arg of perigee: 358.7317 deg  
Mean anomaly: 0.6246 deg  
Mean motion: 15.58545846 rev/day  
Decay rate: 7.939e-05 rev/day^2  
Epoch rev: 44304  
Checksum: 317

Satellite: HUBBLE  
Catalog number: 20580  
Epoch time: 93320.38852573  
Element set: 362  
Inclination: 28.4687 deg  
RA of node: 163.2233 deg  
Eccentricity: 0.0004748  
Arg of perigee: 200.0009 deg  
Mean anomaly: 160.0464 deg  
Mean motion: 14.92922012 rev/day  
Decay rate: 7.48e-06 rev/day^2  
Epoch rev: 19427  
Checksum: 277

Satellite: GRO  
Catalog number: 21225  
Epoch time: 93321.24933334  
Element set: 222  
Inclination: 28.4618 deg  
RA of node: 264.6526 deg  
Eccentricity: 0.0074975  
Arg of perigee: 90.1642 deg  
Mean anomaly: 270.7885 deg  
Mean motion: 15.58731637 rev/day  
Decay rate: 1.8416e-04 rev/day^2  
Epoch rev: 2420  
Checksum: 299

Satellite: UARS  
Catalog number: 21701  
Epoch time: 93315.59270845  
Element set: 412  
Inclination: 56.9842 deg  
RA of node: 310.8939 deg  
Eccentricity: 0.0005642  
Arg of perigee: 92.8950 deg  
Mean anomaly: 267.4094 deg  
Mean motion: 14.96195848 rev/day  
Decay rate: -1.996e-05 rev/day^2  
Epoch rev: 11836  
Checksum: 336

Satellite: POSAT  
Catalog number: 22829  
Epoch time: 93289.11726978  
Element set: 204  
Inclination: 98.6763 deg

RA of node: 2.0610 deg  
Eccentricity: 0.0010043  
Arg of perigee: 184.4594 deg  
Mean anomaly: 175.6498 deg  
Mean motion: 14.27975951 rev/day  
Decay rate: 7.2e-07 rev/day^2  
Epoch rev: 286  
Checksum: 317

/EX

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Date: Fri, 19 Nov 1993 06:37:00 MST  
From: nnntp.ucsbs.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!  
nnntp.cs.ubc.ca!alberta!ugc!nebulus!ve6mgs!usenet@network.ucsd.edu  
Subject: ORBS\$323.OSCAR.AMSAT  
To: ham-space@ucsd.edu

SB KEPS @ AMSAT \$ORBS-323.0  
Orbital Elements 323.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES  
FROM WA5QGD FORT WORTH,TX November 19, 1993  
BID: \$ORBS-323.0  
TO ALL RADIO AMATEURS BT

Satellite: A0-10  
Catalog number: 14129  
Epoch time: 93321.57691393  
Element set: 211  
Inclination: 27.1956 deg  
RA of node: 355.7539 deg  
Eccentricity: 0.6019652  
Arg of perigee: 131.0023 deg  
Mean anomaly: 299.1524 deg  
Mean motion: 2.05880635 rev/day  
Decay rate: -1.12e-06 rev/day^2  
Epoch rev: 7841  
Checksum: 293

Satellite: U0-11  
Catalog number: 14781  
Epoch time: 93320.59791365  
Element set: 612  
Inclination: 97.7971 deg  
RA of node: 340.1743 deg  
Eccentricity: 0.0010901

Arg of perigee: 227.3657 deg  
Mean anomaly: 132.6634 deg  
Mean motion: 14.69084435 rev/day  
Decay rate: 2.24e-06 rev/day<sup>2</sup>  
Epoch rev: 51909  
Checksum: 310

Satellite: RS-10/11  
Catalog number: 18129  
Epoch time: 93320.53837545  
Element set: 812  
Inclination: 82.9209 deg  
RA of node: 126.0240 deg  
Eccentricity: 0.0010352  
Arg of perigee: 256.4589 deg  
Mean anomaly: 103.5413 deg  
Mean motion: 13.72326438 rev/day  
Decay rate: 6.1e-07 rev/day<sup>2</sup>  
Epoch rev: 32074  
Checksum: 277

Satellite: A0-13  
Catalog number: 19216  
Epoch time: 93315.34314830  
Element set: 813  
Inclination: 57.8997 deg  
RA of node: 284.7483 deg  
Eccentricity: 0.7226538  
Arg of perigee: 327.9276 deg  
Mean anomaly: 3.4613 deg  
Mean motion: 2.09719999 rev/day  
Decay rate: -5.3e-07 rev/day<sup>2</sup>  
Epoch rev: 4143  
Checksum: 336

Satellite: F0-20  
Catalog number: 20480  
Epoch time: 93310.07362541  
Element set: 607  
Inclination: 99.0217 deg  
RA of node: 139.2984 deg  
Eccentricity: 0.0541030  
Arg of perigee: 125.0547 deg  
Mean anomaly: 240.2545 deg  
Mean motion: 12.83221816 rev/day  
Decay rate: -5.0e-08 rev/day<sup>2</sup>  
Epoch rev: 17551  
Checksum: 267

Satellite: A0-21  
Catalog number: 21087  
Epoch time: 93320.47796564  
Element set: 368  
Inclination: 82.9418 deg  
RA of node: 300.1208 deg  
Eccentricity: 0.0034449  
Arg of perigee: 319.1873 deg  
Mean anomaly: 40.6687 deg  
Mean motion: 13.74528168 rev/day  
Decay rate: 8.4e-07 rev/day^2  
Epoch rev: 14036  
Checksum: 318

Satellite: RS-12/13  
Catalog number: 21089  
Epoch time: 93317.61990766  
Element set: 612  
Inclination: 82.9233 deg  
RA of node: 171.3110 deg  
Eccentricity: 0.0029494  
Arg of perigee: 351.2997 deg  
Mean anomaly: 8.7626 deg  
Mean motion: 13.74029180 rev/day  
Decay rate: 4.0e-08 rev/day^2  
Epoch rev: 13904  
Checksum: 305

Satellite: ARSENE  
Catalog number: 22654  
Epoch time: 93319.82294071  
Element set: 209  
Inclination: 1.4256 deg  
RA of node: 113.1022 deg  
Eccentricity: 0.2930832  
Arg of perigee: 161.7997 deg  
Mean anomaly: 211.8626 deg  
Mean motion: 1.42202608 rev/day  
Decay rate: -5.2e-07 rev/day^2  
Epoch rev: 272  
Checksum: 263

/EX

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Date: Fri, 19 Nov 1993 06:44:00 MST

From: nntp.ucsb.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!  
nntp.cs.ubc.ca!alberta!ugc!nebulus!ve6mgs!usenet@network.ucsd.edu  
Subject: ORBS\$323.WEATH.AMSAT  
To: ham-space@ucsd.edu

SB KEPS @ AMSAT \$ORBS-323.W  
Orbital Elements 323.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES  
FROM WA5QGD FORT WORTH,TX November 19, 1993  
BID: \$ORBS-323.W  
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9  
Catalog number: 15427  
Epoch time: 93321.67817478  
Element set: 612  
Inclination: 99.0821 deg  
RA of node: 4.3682 deg  
Eccentricity: 0.0015882  
Arg of perigee: 95.7490 deg  
Mean anomaly: 264.5523 deg  
Mean motion: 14.13562457 rev/day  
Decay rate: 1.05e-06 rev/day^2  
Epoch rev: 46046  
Checksum: 314

Satellite: NOAA-10  
Catalog number: 16969  
Epoch time: 93315.75032400  
Element set: 509  
Inclination: 98.5140 deg  
RA of node: 326.3695 deg  
Eccentricity: 0.0012248  
Arg of perigee: 244.0314 deg  
Mean anomaly: 115.9574 deg  
Mean motion: 14.24842726 rev/day  
Decay rate: 8.1e-07 rev/day^2  
Epoch rev: 37164  
Checksum: 297

Satellite: MET-2/17  
Catalog number: 18820  
Epoch time: 93319.86072672  
Element set: 211  
Inclination: 82.5421 deg  
RA of node: 78.2816 deg  
Eccentricity: 0.0017893



Arg of perigee: 61.8037 deg  
Mean anomaly: 298.4910 deg  
Mean motion: 13.84697554 rev/day  
Decay rate: 6.5e-07 rev/day<sup>2</sup>  
Epoch rev: 29283  
Checksum: 334

Satellite: MET-3/2  
Catalog number: 19336  
Epoch time: 93319.83299665  
Element set: 211  
Inclination: 82.5384 deg  
RA of node: 114.6617 deg  
Eccentricity: 0.0017926  
Arg of perigee: 77.8342 deg  
Mean anomaly: 282.4811 deg  
Mean motion: 13.16962335 rev/day  
Decay rate: 4.3e-07 rev/day<sup>2</sup>  
Epoch rev: 25517  
Checksum: 319

Satellite: NOAA-11  
Catalog number: 19531  
Epoch time: 93315.67695101  
Element set: 409  
Inclination: 99.1508 deg  
RA of node: 294.5292 deg  
Eccentricity: 0.0012515  
Arg of perigee: 27.3413 deg  
Mean anomaly: 332.8509 deg  
Mean motion: 14.12931327 rev/day  
Decay rate: 1.65e-06 rev/day<sup>2</sup>  
Epoch rev: 26450  
Checksum: 291

Satellite: MET-2/18  
Catalog number: 19851  
Epoch time: 93320.51300057  
Element set: 212  
Inclination: 82.5191 deg  
RA of node: 313.4772 deg  
Eccentricity: 0.0015680  
Arg of perigee: 100.7230 deg  
Mean anomaly: 259.5690 deg  
Mean motion: 13.84349177 rev/day  
Decay rate: 4.5e-07 rev/day<sup>2</sup>  
Epoch rev: 23826  
Checksum: 288

Satellite: MET-3/3  
Catalog number: 20305  
Epoch time: 93320.32104910  
Element set: 913  
Inclination: 82.5525 deg  
RA of node: 57.5423 deg  
Eccentricity: 0.0017403  
Arg of perigee: 95.7518 deg  
Mean anomaly: 264.5640 deg  
Mean motion: 13.16021908 rev/day  
Decay rate: 4.3e-07 rev/day<sup>2</sup>  
Epoch rev: 19511  
Checksum: 262

Satellite: MET-2/19  
Catalog number: 20670  
Epoch time: 93320.64092393  
Element set: 712  
Inclination: 82.5491 deg  
RA of node: 17.2997 deg  
Eccentricity: 0.0016711  
Arg of perigee: 28.5586 deg  
Mean anomaly: 331.6512 deg  
Mean motion: 13.84181803 rev/day  
Decay rate: 1.5e-07 rev/day<sup>2</sup>  
Epoch rev: 17121  
Checksum: 291

Satellite: FY-1/2  
Catalog number: 20788  
Epoch time: 93314.27490495  
Element set: 816  
Inclination: 98.8528 deg  
RA of node: 336.2622 deg  
Eccentricity: 0.0014224  
Arg of perigee: 264.8255 deg  
Mean anomaly: 95.1288 deg  
Mean motion: 14.01329924 rev/day  
Decay rate: 3.52e-06 rev/day<sup>2</sup>  
Epoch rev: 16304  
Checksum: 314

Satellite: MET-2/20  
Catalog number: 20826  
Epoch time: 93320.47980517  
Element set: 711  
Inclination: 82.5249 deg

RA of node: 315.2181 deg  
Eccentricity: 0.0011921  
Arg of perigee: 288.0238 deg  
Mean anomaly: 71.9627 deg  
Mean motion: 13.83563968 rev/day  
Decay rate: 5.2e-07 rev/day^2  
Epoch rev: 15834  
Checksum: 308

Satellite: MET-3/4  
Catalog number: 21232  
Epoch time: 93320.51833216  
Element set: 615  
Inclination: 82.5409 deg  
RA of node: 319.9466 deg  
Eccentricity: 0.0013471  
Arg of perigee: 2.5209 deg  
Mean anomaly: 357.5653 deg  
Mean motion: 13.16456371 rev/day  
Decay rate: 4.3e-07 rev/day^2  
Epoch rev: 12337  
Checksum: 280

Satellite: NOAA-12  
Catalog number: 21263  
Epoch time: 93315.68793624  
Element set: 816  
Inclination: 98.6427 deg  
RA of node: 343.0215 deg  
Eccentricity: 0.0013434  
Arg of perigee: 143.1680 deg  
Mean anomaly: 217.0407 deg  
Mean motion: 14.22331177 rev/day  
Decay rate: 1.76e-06 rev/day^2  
Epoch rev: 12961  
Checksum: 285

Satellite: MET-3/5  
Catalog number: 21655  
Epoch time: 93320.38880675  
Element set: 612  
Inclination: 82.5551 deg  
RA of node: 267.0163 deg  
Eccentricity: 0.0014334  
Arg of perigee: 12.2322 deg  
Mean anomaly: 347.9178 deg  
Mean motion: 13.16825934 rev/day  
Decay rate: 4.3e-07 rev/day^2

Epoch rev: 10845  
Checksum: 293

Satellite: MET-2/21  
Catalog number: 22782  
Epoch time: 93320.66678128  
Element set: 211  
Inclination: 82.5521 deg  
RA of node: 14.8526 deg  
Eccentricity: 0.0023798  
Arg of perigee: 100.3379 deg  
Mean anomaly: 260.0455 deg  
Mean motion: 13.82991168 rev/day  
Decay rate: 3.3e-07 rev/day^2  
Epoch rev: 1071  
Checksum: 288

/EX

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End of Ham-Space Digest V93 #91

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